

**DETERMINATION OF MULTIPATH ERROR BY USING GPS DUAL
FREQUENCY DATA**

**Project thesis presented in the partial fulfillment for the award of the
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In the Name of ALLAH S.W.T

Most Gracious Most Merciful

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ABSTRACT

The purpose of this project is to determine multipath error by using GPS dual frequency data, L1 and L2. The RINEX (Receiver Independent Exchange) data from six MASS (Malaysia Active GPS System) stations are acquired from DSMM (Department of Survey and Mapping Malaysia) for analysis purposes. The stations are BEHR, BINT, KUAN, LABU, USMP and UTMJ. The analysis for this project divided by three categories, namely analysis on surrounding area of MASS station, analysis on satellite track and analysis on rainfall effect. For analysis on surrounding area, all RINEX data from six stations were used, while for analysis on satellite track, RINEX data from BINT station and LABU station were used, and for analysis on rainfall, RINEX data from KUAN station and UTMJ station were used based on data of rainfall from MMD (Malaysian Meteorological Department). TEQC (Translating, Editing, Quality Check) software were used to extract the RINEX data and generate several file such as MP1 (multipath carrier L1), MP2 (multipath carrier L2) and report file for analysis purpose. MATLAB software were used for plotting graph to perceive the value of multipath for each analysis. The result from analysis on surrounding area obtained, shows the residential area and urban area has highest value of multipath error and open area has lowest value of multipath error, while the result from analysis on satellite track obtained, and shows satellite track farthest from MASS station has highest value of multipath error, and satellite track nearest to MASS station has lowest value of multipath error. The result from analysis on rainfall shows the value of multipath error not influenced by reading of rainfall. Based on the result from all analysis in this project, that will contribute in enhancing the efficiency of data transmission process.

TABLE OF CONTENTS

CONTENTS	PAGE
DECLARATION	i
ACKNOWLEDGEMENT	ii
ABSTRACT	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vii
LIST OF FIGURES	viii
ABBREVIATION	x
CHAPTER 1: PROJECT OVERVIEW	
1.1 Background of Study	1
1.2 Problem Statement	2
1.3 Objective	3
1.4 Scope of Work	3
1.5 Thesis organization	4
CHAPTER 2: LITERATURE REVIEW	
2.1 GPS (Global Positioning System)	5
2.1.1 Introduction	5
2.1.2 The Space Segment	6
2.1.3 The Control Segment	8
2.1.4 The User Segment	9
2.1.5 Fundamental GPS measurement	9
2.1.5.1 Pseudorange Measurement	9

CHAPTER 1

PROJECT OVERVIEW

1.1 BACKGROUND OF STUDY

The Global Positioning System (GPS) has been shown to be capable of supporting a wide variety of exciting applications. However, multipath is a dominant error source in the widespread use of GPS in real-time operations for general surveying and monitoring applications. Multipath is the phenomenon in which a signal arrives at an antenna via several paths due to signal reflection and diffraction as shows in figure 1.1. GPS carrier phase measurements are affected by multipath signals that can significantly affect the quality of data used for static and kinematic positioning applications.

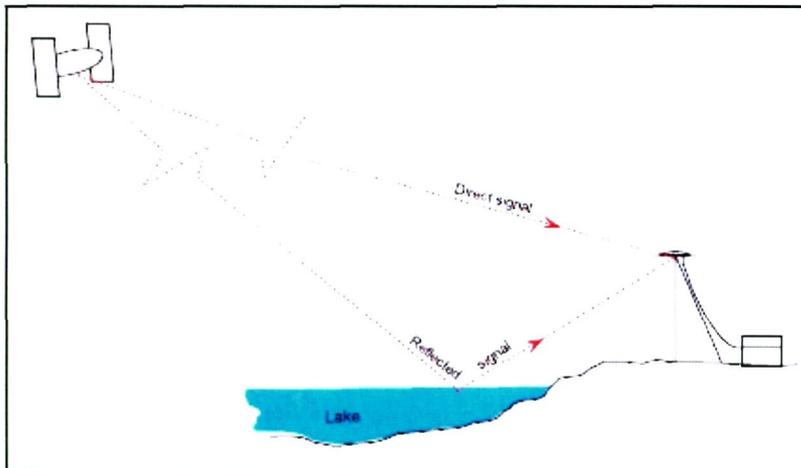


Figure 1.1: Multipath phenomenon [14].

The purpose of this project is to determine multipath error by using GPS dual frequency data. For analysis purposes, multipath error are characterise base on surrounding area of MASS (Malaysia Active GPS System) station, satellite track and effect on rainfall. In this project, data from six MASS stations has been analysed by using TEQC software. The TEQC is software developed by UNAVCO (University NAVSTAR Consortium). The software is named after its three main functions: Translating, Editing, and Quality Check. This software